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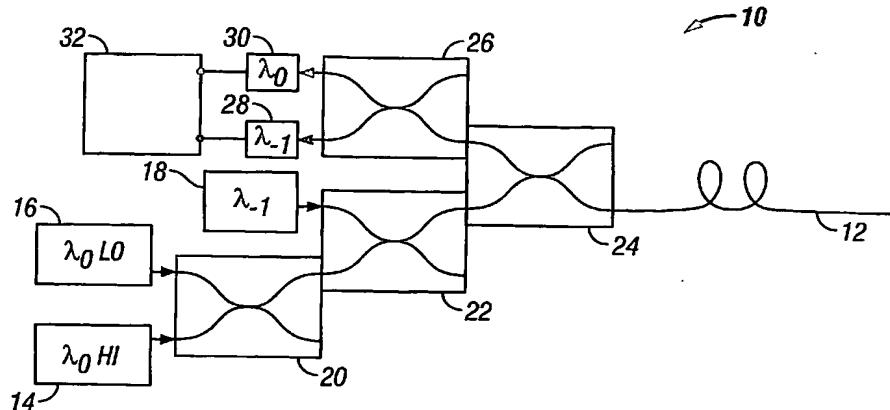
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(54) Title: DISTRIBUTED OPTICAL FIBRE MEASUREMENTS



(57) Abstract: A method of obtaining a distributed measurement comprises deploying an optical fibre in a measurement region of interest, and launching into it a first optical signal at a first wavelength  $\lambda_0$  and a high power level, a second optical signal at a second wavelength  $\lambda_1$ , and a third optical signal at the first wavelength  $\lambda_0$  and a low power level. These optical signals generate backscattered light at the second wavelength  $\lambda_1$  arising from Raman scattering of the first optical signal which is indicative of a parameter to be measured, at the first wavelength  $\lambda_0$  arising from Rayleigh scattering of the first optical signal, at the second wavelength  $\lambda_1$  arising from Rayleigh scattering of the second optical signal, and at the first wavelength  $\lambda_0$  arising from Rayleigh scattering of the third optical signal. The backscattered light is detected to generate four output signals, and a final output signal is derived by normalising the Raman scattering signal to a function derived from the three Rayleigh scattering signals, which removes the effects of wavelength-dependent and nonlinear loss.